

Claims:

1. (Currently Amended) A method of manufacturing a polyisocyanurate foam insulation board, the method comprising:

contacting a stream of reactants that comprise an isocyanate-reactive compound with a stream of reactants that include an isocyanate compound to form a reaction product, where said step of contacting takes place in a mix head in the presence of a blowing agent and ~~nitrogen~~ air, where the blowing agent is selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gases, where the ~~nitrogen~~ air is dissolved in the stream of reactants comprising the isocyanate-reactive compound, or the stream of reactants including the isocyanate compound, or both, and where the amount of ~~nitrogen~~ air dissolved is an amount ~~at least 1.25 times the Bunsen Coefficient for nitrogen dissolved in the stream~~ sufficient to increase the volume of developing foam as it instantaneously leaves the mix head by at least 1.25.

2-29 Cancelled

30. (Currently Amended) The method of claim [1] 42, where the ~~nitrogen~~ air is dissolved in the stream including the isocyanate-reactive compound, and where the amount of ~~nitrogen~~ air dissolved is an amount ~~at least 1.5 times the Bunsen Coefficient for nitrogen dissolved in the stream~~ sufficient to increase the volume of developing foam as it instantaneously leaves the mix head by at least 1.5.

31. (Currently Amended) The method of claim [1] 42, where the ~~nitrogen~~ air is dissolved in the stream including the isocyanate-reactive compound, and where the amount of ~~nitrogen~~ air dissolved is an amount ~~at least 2.0 times the Bunsen Coefficient for nitrogen dissolved in the stream~~ sufficient to increase the volume of developing foam as it instantaneously leaves the mix head by at least 1.75.

32. (Currently Amended) The method of claim [1] 42, where the blowing agent includes n-pentane, isopentane, cyclopentane, and mixtures thereof.

33. (Previously presented) The method of claim 32, where the blowing agent is devoid of hydrofluorocarbons and hydrochlorofluorocarbons.

34. (Currently Amended) A method for ~~increasing the dimensional stability of~~ making polyisocyanurate foams, the method comprising:

providing an A-side stream of reactants that include an isocyanate to a mix head;

providing a B-side stream of reactants that include a isocyanate reactive component and a blowing agent selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gases to the mix head;

adding nitrogen to the A-side or B-side stream of reactants, where the amount of nitrogen added to the A-side or B-side stream of reactants is an amount sufficient to increase the volume of developing foam as it instantaneously leaves the mix head by at least 1.25.

35. (Currently Amended) The method of claim [34] 47, where the nitrogen is added to the B-side stream of reactants, and where the amount of nitrogen added to the B-side stream of reactants is an amount sufficient to increase the volume of the developing foam as it instantaneously leaves the mix head by at least 1.5.

36. (Previously presented) The method of claim 35, where the nitrogen is added to the B-side stream of reactants, and where the amount of nitrogen added to the B-side stream of reactants is an amount sufficient to increase the volume of the developing foam as it instantaneously leaves the mix head by at least 1.75.

37. (Currently Amended) The method of claim [34] 47, where the blowing agent includes n-pentane, isopentane cyclopentane, and mixtures thereof.

38. (Previously presented) The method of claim 37, where the blowing agent is devoid of hydrofluorocarbons and hydrochlorofluorocarbons.

39. (Currently Amended) A method for ~~increasing the dimensional stability of~~ making polyisocyanurate foams, the method comprising:

providing an A-side stream of reactants that include an isocyanate;

providing a B-side stream of reactants that include [a] an isocyanate reactive component and a blowing agent selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gases;

adding nitrogen to the A-side or B-side stream of reactants; and

contacting the A-side and B-side streams of reactants in a mix head at a temperature of about 18° C to 29° C and a pressure of about 1800 psi to 2400 psi, where the amount of nitrogen added to the A-side or B-side stream of reactants is an amount sufficient to ~~increase the amount of dissolved nitrogen within the B-side stream to at least 1.25 times the Bunsen Coefficient~~ increase the volume of developing foam as it instantaneously leaves the mix head by at least 1.25.

40. (Currently Amended) The method of claim 39, where the nitrogen is added to the B-side stream of reactants, and where the amount of nitrogen added to the B-side stream of reactants is an amount sufficient to ~~increase the amount of dissolved nitrogen within the B-side stream to at least 1.5 times the Bunsen Coefficient~~ increase the volume of developing foam as it instantaneously leaves the mix head by at least 1.5.

41. (Cancelled)

42. (New) The method of claim 1, where the streams of reactants are contacted in the mix head at a pressure of about 1800 psi to 2400 psi.

43. (New) The method of claim 42, further comprising the step of depositing the developing foam on a laminator.

44. (New) The method of claim 43, where the developing foam is continuously deposited on the laminator.

45. (New) The method of claim 43, where the developing foam is deposited on the laminator such that a proportionally greater amount is deposited near the edges of the board.
46. (New) The method of claim 1, where the A-side isocyanate is selected from the group consisting of diphenyl methane, diisocyanate, diphenyl methane diisocyanates and toluene diisocyanate, or mixtures thereof.
47. (New) The method of claim 34, where the A-side and B-side streams of reactants are contacted in the mix head at a pressure of about 1800 psi to 2400 psi.
48. (New) The method of claim 47, further comprising the step of depositing the developing foam on a laminator.
49. (New) The method of claim 48, where the developing foam is continuously deposited on the laminator.
50. (New) The method of claim 48, where the developing foam is deposited on the laminator such that a proportionally greater amount is deposited near the edges of the board.
51. (New) The method of claim 34, where the A-side isocyanate is selected from the group consisting of diphenyl methane, diisocyanate, diphenyl methane diisocyanates and toluene diisocyanate, or mixtures thereof.
52. (New) The method of claim 39, where the nitrogen is added to the B-side stream of reactants, and where the amount of nitrogen added to the B-side stream of reactants is an amount sufficient to increase the volume of the developing foam as it instantaneously leaves the mix head by at least 1.75.
53. (New) The method of claim 39, where the blowing agent includes n-pentane, isopentane, cyclopentane, and mixtures thereof.

54. (New) The method of claim 53, where the blowing agent is devoid of hydrofluorocarbons and hydrochlorofluorocarbons.

55. (New) The method of claim 39, where the developing foam is continuously deposited on the laminator.

56. (New) A method of manufacturing a polyisocyanurate foam insulation board including continuously contacting a stream of reactants that comprise an isocyanate-reactive compound with a stream of reactants that include an isocyanate compound in a mix head to form a developing foam reaction product, and continuously depositing the developing foam on a facer in a laminator, the method comprising:

introducing an inert gas having a boiling point of less than 20°C into the stream of reactants including the isocyanate-reactive compound or the stream of reactants including the isocyanate compound, or both, where the stream of reactants including the isocyanate-reactive compound and the stream of reactants including the isocyanate compound are continuously contacted in the presence of a blowing agent, where the blowing agent is selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gases, and where the amount of inert gas introduced in the stream of reactants is an amount sufficient to increase the volume of developing foam as it instantaneously and continuously leaves the mix head by at least 1.25.

57. (New) The method of claim 56, where the A-side and B-side streams of reactants are contacted in the mix head at a temperature of about 18° C to 29° C and a pressure of about 1800 psi to 2400 psi.

58. (New) The method of claim 57, where the inert gas has a boiling point of less than 10°C.

59. (New) The method of claim 58, where the inert gas has a boiling point of about -1° C.

60. (New) The method of claim 57, where the inert gas is added to the stream of reactants including the isocyanate-reactive compound, and where the amount of inert gas added is an amount sufficient to increase the volume of the developing foam as it instantaneously and continuously leaves the mix head by at least 1.5.

61. (New) The method of claim 60, where the inert gas is added to the stream of reactants including the isocyanate-reactive compound, and where the amount of inert gas added is an amount sufficient to increase the volume of the developing foam as it instantaneously and continuously leaves the mix head by at least 1.75.

62. (New) The method of claim 61, where the blowing agent includes n-pentane, isopentane, cyclopentane, and mixtures thereof.

63. (New) The method of claim 57, where the developing foam is deposited on the laminator such that a proportionally greater amount is deposited near the edges of the board.

64. (New) A method for making polyisocyanurate foams, the method comprising:
providing an A-side stream of reactants including an isocyanate to a mix head;
providing a B-side stream of reactants that include a isocyanate- reactive component and a blowing agent selected from the group consisting of alkanes, (cyclo)alkanes, hydrofluorocarbons, hydrochlorofluorocarbons, fluorocarbons, fluorinated ethers, alkenes, alkynes and noble gases to the mix head; and
adding an inert gas to the A-side or B-side stream of reactants, where the amount of inert gas added to the A-side or B-side stream of reactants is an amount sufficient to increase the volume of developing foam as it instantaneously leaves the mix head by at least 1.25,
where the A-side and B-side streams of reactants are contacted in the mix head at a temperature of about 18° C to 29° C and a pressure of about 1800 psi to 2400 psi.

65. (New) The method of claim 64, where the inert gas has a boiling point of less than 20° C.

66. (New) The method of claim 65, where the inert gas has a boiling point of less than 10° C.
67. (New) The method of claim 66, where the inert gas has a boiling point of about -1° C.
68. (New) The method of claim 67, where the inert gas has a boiling point of less than -18° C.
69. (New) The method of claim 56, where the developing foam is frothy.